

1B. NATALITY: MATERNAL CHARACTERISTICS AND NEWBORN'S HEALTH

TRENDS AND PATTERNS IN NATALITY

BIRTHS AND BIRTH RATES

Following a decline in the annual number of births from 1990 to 1991, the number of babies born to Arizona residents increased for the eighth consecutive year from 77,940 in 1998 to 80,505 in 1999. However, this increase in the number of births was smaller than the 3.5 percent population increase in the number of females of childbearing age (15-44 years old) and effected a 1.2 reduction in birth rate (**Table 1B-1**). In fact, the 1999 birth rate of 16.3/1,000 population was the lowest rate of the period from 1989 to 1999. In 1989, one baby was born for about every 55 Arizonans, while one (1) birth per approximately 61 residents of the state occurred in 1999.

FERTILITY RATES

From among 1,045,925 women of childbearing age (15-44 years), 7.7 percent gave birth in 1999 compared to 7.9 percent in 1989. The 1999 total fertility rate of Arizona's women (2,382 in **Table 1B-1**) exceeded the generation replacement rate of 2,110 by 12.9 percent. Except for women 24 years or younger, all age-specific birth rates were higher in 1999 than in 1989.

MATERNAL AGE

In 1999, teenagers aged 19 years and younger accounted for 12.1 percent of total births, the lowest fraction reported in the 1989-1999 period (**Table 1B-2**). The birth rate for teenagers 15-19 years old in 1999 was 60.2 births per 1,000 women in this age group, 16 percent lower than the rate of 71.7/1,000 in 1989. Except for Hispanics and Asians, Arizona birth rates by ethnic group among teens aged 15-19 in 1999 were lower than among their respective national peers (**Figure 1B-1**).

Women in their thirties and forties accounted in 1999 for 32.6 percent of total births, the same fraction as in 1998 (**Table 1B-2**). The birth rates for women aged 30-34 and 40-44 years in 1999 (91/1,000 and 9.7/1,000 respectively) were the highest reported since 1989 (**Figure 1B-2, Table 1B-1**).

MOTHER'S RACE AND ETHNICITY

White non-Hispanic, Black and American Indian mothers each accounted for a smaller share of all births in 1999 than in 1989 (**Table 1B-2**). Hispanic women accounted for a 46 percent larger share of births in 1999 compared to 1989. Among every 100 babies born in Arizona in 1999, there were 48 non-Hispanic whites, 38 Hispanics, 7 American Indians, 3 Blacks and 2 Asians or Pacific Islanders. Mother's race/ethnicity was unknown for 1.4 percent of total births.

MOTHER'S EDUCATION

During 1999, 9 percent of the resident live births were to mothers who had less than a ninth grade education compared

to 8.8 percent in 1998. Almost four out of ten (35.6 percent) mothers giving birth in 1999 had some college education (13 or more grades completed, **Table 1B-21**).

MARITAL STATUS

Unwed mothers have accounted for an increasing annual proportion of births throughout the 1970s and 1980s, with 38.8 percent in 1996 marking a new historical high (**Table 1B-2**). The percent of births to unmarried mothers declined slightly in 1997 to 37.7 percent, but then it increased to 38.4 percent in 1998 and again to 38.8 percent in 1999. Less than 21,000 babies were born to unwed mothers in 1989 compared to 31,272 in 1999.

PLACE OF DELIVERY

There was virtually no change in place of delivery-utilization patterns between 1991 and 1999. Among every 100 births, 99 were reported to have occurred in hospitals, clinics, medical centers or maternity homes (**Table 1B-2**).

ATTENDANT AT BIRTH

The proportion of births attended by doctors of medicine and doctors of osteopathy increased slightly from 89.9 percent of all births in 1998 to 91.3 percent in 1999. Total midwife deliveries accounted for 8.7 percent of all births in 1999 compared with 7.8 percent in 1989 (**Table 1B-2**).

MULTIPLE BIRTHS

The number of babies born in multiple deliveries increased by 54.3 percent from 1,366 in 1989 (**Table 1B-16**) to

2,107 in 1999, the latter being the highest number ever reported. In contrast, the number of single births increased by 19.2 percent over this period.

The number of twins increased by 48.9 percent, from 1,327 in 1989 to 1,976 in 1999 (**Figure 1B-3**). The number of live births in triplet and other higher order multiple deliveries rose from 39 in 1989 to 131 in 1999 (**Figure 1B-4**). The rise in the multiple-birth ratio has been associated with the increased childbearing among older women and expanded use of fertility drugs. Among mothers 45 years and older in 1999, twins accounted for almost ten percent of all births. Plurality is associated with low birthweight (LBW) and 57.2 percent of all babies born in multiple deliveries in 1999 weighed less than 2,500 grams or 5 pounds 8 ounces (**Table 1B-16**).

PERIOD OF GESTATION

The incidence of births through the end of the last day of the 37th week of gestation (259th day) increased by 40.5 percent, from 12.6 percent of total births in 1989, to 17.7 percent in 1999. Most of the rise in preterm births can be attributed to increases in multiple deliveries.

PRENATAL CARE

The percent of mothers who did receive early prenatal care (i.e., in the first trimester of pregnancy) increased from 73.6 in 1998 to 74.1 percent in 1999. The percent of women giving birth with no prenatal care increased slightly from 2.1 percent in 1998 to 2.2 percent in 1999 (**Table 1B-2**). In each year from 1989 to 1999, the percent of women giving birth who had received prenatal

care in the first trimester was lower in Arizona compared to the nation (**Figure 1B-5**).

WEIGHT AT BIRTH

In 1999, 7 percent of the resident live births were classified as low birthweight (LBW: under 2,500 grams or 5 pounds 8 ounces, **Table 1B-2**). This proportion of LBW births was the highest reported since at least 1980. In absolute numbers, 1,373 more newborns were placed at risk of poorer medical and developmental outcomes in 1999 than in 1989 (**Table 1B-3**). Compared to 1989, the LBW babies in 1999 were more likely to be born in multiple deliveries and to have older, unmarried mothers.

In each year from 1989 to 1999, the annual incidence of LBW babies was lower in Arizona compared to the nation (**Figure 1B-6**).

The incidence of very low birthweight births (VLBW, less than 1,500 grams or 3 pounds 4 ounces) increased from 1.1 percent in 1998 to 1.2 percent in 1999 (**Table 1B-2**).

REGIONAL COMPARISONS

Data for urban counties (Maricopa, Pima, Pinal and Yuma) and rural counties (all other counties) are given in **Tables 1B-4, 1B-5, 1B-6** and **1B-7**. The relative standing between women in the two county classifications on a number of maternal characteristics was similar in 1989 and 1999.

Rural relative to urban mothers were more likely to be teenagers; be unmarried; enter prenatal care in the third trimester; have a birth delivered

by a midwife; and have a prior live birth. In each year from 1989 to 1999, the LBW rate was lower for urban than for rural babies (6.3 and 6.5 percent respectively). In contrast, in any year since 1994, rural compared to urban mothers were less likely to have a very low birthweight baby.

The use of midwives was 2 times more common among rural than urban mothers in 1999, a situation probably stemming partially from the shortage of physicians with an obstetrical practice in many rural areas.

In 1999, the Arizona Health Care Cost Containment System (AHCCCS) paid for 40 percent of the urban but for 49 percent of the rural deliveries (percentages calculated from data in **Table 1B-26**). Private insurance paid for the majority (54 percent) of deliveries to urban mothers. It remained a minority payee for rural mothers (33.5 percent of all rural deliveries).

Rural mothers were more likely to smoke during pregnancy than were urban mothers in 1999 (10.3 vs. 6.8 percent respectively).

The percent of infants born with a congenital anomaly in 1999 was 3.3 times greater in rural (3 percent of all rural births) than urban newborns (0.9 percent of all urban births).

In 1999, urban newborns were admitted to newborn intensive care units at a higher rate than rural newborns (7.0 and 4.5 percent respectively). Low birthweight (LBW) newborns comprised 62.3 percent of rural admissions but 42.2 percent of urban admissions (calculated from data in **Table 5B-24**).

MATERNAL CHARACTERISTICS AND NEWBORN'S HEALTH: 1999 STATUS

PROFILE OF WHITE NON-HISPANIC NEWBORNS

The total number of births to non-Hispanic white mothers slightly increased from 38,611 in 1998 to 38,711 in 1999. The LBW rate of non-Hispanic white infants was 9.8 percent higher in 1999 than it was in 1989 (6.7 vs. 6.1 percent, **Table 1B-8**). The incidence of non-Hispanic white births through the end of the last day of the 37th week of gestation decreased from a high of 18 percent in 1997 to 17.7 percent in 1999. Babies born at gestational age of 37 or less weeks accounted for 80.2 percent of white non-Hispanic LBW infants in 1999 compared to 73.2 percent in 1989. The majority of white non-Hispanic LBW babies in 1999 were girls (**Table 1B-9**); were delivered in a hospital; were born to mothers who began prenatal care early (79.3 percent) and had 5 or more prenatal visits (82.6 percent), medical risks or complications (70.5 percent) and a prior live birth (56.0 percent). Mothers of white non-Hispanic LBW infants were 4.8 times more likely to be older than 29 years (42.3 percent) than to be teenagers (8.8 percent). Twenty-five out of one hundred LBW newborns were born in multiple deliveries and 39.5 percent were delivered by caesarean section.

In each year from 1989 to 1999 the incidence of LBW babies among non-Hispanic white deliveries paid for by AHCCCS was greater than the incidence of LBW babies among deliveries paid for by private health insurance (**Figure 1B-7**).

PROFILE OF HISPANIC NEWBORNS

The total number of births to Hispanic mothers increased by 74.3 percent from 17,663 in 1989 to 30,784 in 1999 (**Table 1B-10**). The number of Hispanic LBW doubled during that period, from 1,049 in 1989 to 2,125 in 1999 (**Table 1B-11**). The 1999 LBW rate of 6.9 percent was 17 percent greater than the 1989 rate of 5.9 percent. The majority of Hispanic LBW babies were born to unmarried mothers (55.8 percent) who began prenatal care in the first trimester (59.9 percent); had 5 or more prenatal visits (74.3 percent); had medical risks and or complications (66 percent) and a prior live birth (60.1 percent). Among Hispanic LBW babies, 77.9 percent were born at a gestational age of 37 or less weeks in 1999, compared to 81.4 percent in 1998. Thirty-one out of one hundred Hispanic LBW babies were delivered by caesarean section in 1999. Hispanic mothers of LBW newborns were less likely to be teenagers (19.6 percent) than to be older than 29 years (24.5 percent). In each year from 1989 to 1999 (except 1995) the incidence of LBW babies among Hispanic deliveries paid for by AHCCCS was greater than the incidence of LBW babies among deliveries paid for by private health insurance (**Figure 1B-8**).

PROFILE OF BLACK NEWBORNS

The annual number of births to Black mothers varied between 2,200-2,700 in the 1989-1999 period (**Table 1B-12**). The Black LBW rate decreased from 13.6 percent in 1997 to 12.2 in 1998 and 12.0 in 1999. However, as in previous years, it was the highest LBW rate among the ethnic groups (**Table 1B-12, Table 1B-13**). Among 1999

Black LBW newborns, 79.3 percent were born at 37 or less weeks of gestation compared to 74.8 percent in 1989. Infants weighing no more than 1,500 grams or very low birthweight (VLBW) had their greatest representation among Black newborns (2.5 percent of their total live births). The majority of Black LBW babies were born to mothers who were unmarried (64.4 percent), began prenatal care in the first trimester (68.1 percent) and had 5 or more prenatal visits (74.6 percent), medical risks or complications (70.0 percent) and a prior live birth (61.5 percent). Less than one-third (31.3 percent) were delivered by caesarean section, the second lowest rate among the ethnic groups. Black mothers of LBW babies were less likely to be teenagers (18.6 percent) than older than 29 years (27.6 percent).

In each year from 1989 to 1999 the incidence of LBW babies among Black deliveries paid for by AHCCCS was greater than the incidence of LBW babies among deliveries paid for by private health insurance (**Figure 1B-9**).

PROFILE OF AMERICAN INDIAN NEWBORNS

The total number of live births to American Indian mothers was lower in 1999 (5,295) than it was in 1998 or in any year between 1989 and 1994. The LBW rate for American Indian newborns increased from 6.6 percent in 1998 to 7.6 percent in 1999 (**Table 1B-14**). Babies born at a gestational age of 37 or less weeks accounted for 77.6 percent of American Indian LBW newborns in 1999 compared to 82.0 percent in 1998. The majority of American Indian LBW babies were born to mothers who were unmarried (72.1 percent), had 5 or more prenatal visit

(70.4 percent), medical risks or complications (72.5 percent) and a prior live birth (61.6 percent). Three out of ten LBW babies were delivered by caesarean section. American Indian mothers of LBW newborns were more likely to be older than 29 years (27.9 percent) than to be teenagers (19.0 percent).

In each year from 1989 to 1999 the incidence of LBW babies among American Indian deliveries paid for by AHCCCS was greater than the incidence of LBW babies among deliveries paid for by the Indian Health Service (**Figure 1B-10**).

PROFILE OF ASIAN NEWBORNS

The total number of live births to Asian mothers increased by 85 percent, from 1,014 in 1989 to 1,875 in 1999 (**Table 1B-22**). Unmarried mothers accounted in 1999 for 18.1 percent of Asian births, the lowest proportion among the ethnic groups. Seven out of ten (67.4 percent) Asian mothers had some college education, the highest fraction among the ethnic groups.

The LBW rate increased from 7.3 percent of all Asian births in 1998 to 8.2 percent in 1999 (calculated from data in **Table 1B-26**). Among 1999 Asian LBW newborns, 72.5 percent, were born at 37 or less weeks of gestation. The majority of Asian LBW babies were born to mothers who were married (78.4 percent), had 5 or more prenatal visits (88.2 percent) and medical risk factors or complications of labor and/or delivery (60.8 percent). Asian mothers of LBW newborns were 6.1 times more likely to be older than 29 years (51.6 percent) than to be teenagers (8.5 percent).

The 1999 LBW rate of 8.3/100 among Asian deliveries paid for by AHCCCS exceeded by a mere 1.2 percent the LBW rate of 8.2/100 among deliveries paid for by private health insurance (**Figure 1B-11**).

PARTY PAYING FOR THE DELIVERY

The share of deliveries paid for by private insurance increased from 49.9 percent in 1998 to 50.3 in 1999. In 1999, as in the 1989-1998 period, private insurance paid for the majority (69.9 percent) of deliveries to white non-Hispanic mothers (**Table 1B-29**).

The Arizona Health Care Cost Containment System (AHCCCS) paid for 41.5 percent of the total deliveries in 1999, a decline from 44 percent in 1997 and 41.6 percent in 1998. Among maternal ethnic groups, American Indian mothers had the largest share of deliveries paid for by public sources (AHCCCS or Indian Health Service) at 78.8 percent, followed by Hispanic deliveries at 59.7 percent, Black deliveries at 52.4 percent, white non-Hispanic deliveries at 25.8 percent and Asian deliveries at 20.6 percent.

The Indian Health Service paid for 2 percent of the births in 1999, with 93.5 percent of those births having American Indian mothers. The payment source was the mothers themselves and/or their families (i.e., self-pay) in 4.1 percent of the deliveries and the payment source was unknown for 2.2 percent of the deliveries.

More than 20 percent of AHCCCS mothers were teenagers under age 20 compared to 5 percent of women giving birth who had private insurance coverage in 1999.

Sixty-eight percent of IHS (and 62 percent of AHCCCS) mothers were unwed compared to 16.9 percent of

women giving birth in 1999 who had private insurance coverage (**Table 1B-28**).

Among the three institutional payee groups, babies of IHS mothers had the lowest LBW ratios in the period from 1989 to 1999 (**Figure 1B-12**). Infants of mothers with private health insurance had the next lowest LBW ratios, followed by newborns of AHCCCS mothers. It appears that differences in socioeconomic status alone cannot account for differences in the incidence of low birthweight births among the three payee groups.

MEDICAL RISK FACTORS

The presence of medical risk factors during pregnancy is often indicative of the potential for adverse pregnancy outcome, such as low birthweight and some congenital anomalies (birth defects). Low birthweight and congenital anomalies in turn are among the leading causes of infant death. The most frequently reported risk factors in 1999 (**Table 1B-26**) were *pregnancy-associated hypertension* with a rate of 28.5 cases per 1,000 live births, *diabetes* (21.8 per 1,000 live births), followed by *anemia* (20.7 per 1,000). American Indian mothers were at substantially elevated risk of having each of the three above medical conditions. The rate of *diabetes* was elevated to 66.3/1,000, the rate of *pregnancy-associated hypertension* was 55.7/1,000 and the rate of *anemia* was elevated to 50.6 cases per 1,000 live births. Non-Hispanic white and Hispanic mothers had lower rates of *diabetes* (17.3/1,000 and 19.2/1,000 respectively) than did Black (19.3) and Asian mothers (36.3).

Many of the medical risk factors are associated with elevated risk for low birthweight (**Table 1B-33**). These include *eclampsia* (32.9 percent were

LBW), *hydramnios* (28.8 percent of babies born to mothers with an excess of amniotic fluid were LBW), *previous small-for-gestational-age (SGA) infant* (19.5 percent), *chronic and pregnancy-associated hypertension* (17.8 percent were LBW).

In contrast, mothers who have previously given birth to an infant weighing 4,000 grams or more were at substantially lower risk of giving birth to an LBW infant (only 4.6 percent of babies born to mothers in this group were LBW).

COMPLICATIONS OF LABOR AND DELIVERY

Two complications were reported at a rate greater than 30 per 1,000 live births: *meconium*, *moderate/heavy* (39.3 per 1,000 births) and *breech malpresentation* (34.8/1,000). Of the 15 complications, 10 had higher rates for low birthweight infants and 4 among those (*abruptio placenta*, *placenta previa*, *rupture of the membrane* and *breech malpresentation*) had a proportion of LBW births of at least 25 percent (**Table 1B-33**).

MATERNAL WEIGHT GAIN

Maternal weight gain during pregnancy is an important determinant of both fetal growth and birthweight. In 1999, 19.2 percent of Arizona's women giving birth gained less than 21 pounds. Compared to Asian and white non-Hispanic mothers, Black, Hispanic and American Indian mothers were less likely to gain at least 21 pounds during pregnancy (**Table 1B-26**). Maternal weight gain has been shown to have a positive correlation with the birthweight of the infant. The proportion of low birthweight births was 10 percent among mothers who gained less than 21 pounds, compared with 5.8 percent

of LBW births among mothers who gained at least 21 pounds (base on data in **Table 1B-33**).

TOBACCO SMOKING DURING PREGNANCY

Cigarette smoking during pregnancy has been associated with reduced infant birthweight, intrauterine growth retardation and preterm births. Smoking during pregnancy was reported by 7.3 percent of women giving birth in 1998 (**Table 1B-26**, **Table 5B-30**), compared to 15.2 percent in 1989 when these data first became available from birth certificates. It is unclear, whether this decline means that women giving birth in Arizona are less likely to use tobacco during pregnancy or, perhaps, less likely to report it when they use it. White non-Hispanic mothers were more likely to report smoking (11.7 percent) than Black (10.4 percent), Asian (2.9 percent), Hispanic (2.6 percent) and American Indian (2.2 percent).

ALCOHOL USE DURING PREGNANCY

The most notable effect of heavy maternal drinking during pregnancy is *fetal alcohol syndrome*, which is characterized by growth retardation, facial malformations and dysfunctions of the central nervous system. In 1999, 1.1 percent of all live births were to mothers who reported alcohol use (**Table 1B-26**, **Table 5B-30**). American Indian, non-Hispanic white and Black mothers were more likely than Asian and Hispanic mothers to report the use of alcohol. The rates of babies born with *fetal alcohol syndrome* were substantially higher among American Indian and Asian mothers (5.7 and 5.3 cases per 10,000 births respectively) than they were among non-Hispanic white (0.8/10,000) and Hispanics (0.3/10,000). No cases of fetal alcohol syndrome were reported in 1999 among Blacks.

OBSTETRIC PROCEDURES

The most frequent obstetric procedure reported in 1999 was *electronic fetal monitoring*, done for 82.3 percent of all live births (**Table 1B-26**). At least 80 percent of mothers in each ethnic group received this procedure, with the highest level (85 percent) for Blacks. Of the mothers who had live births in 1999, 69.8 percent received *ultrasound*. White non-Hispanic mothers had the highest rate of *induction of labor* (23 percent) and Hispanic mothers had the lowest rate (11.7 percent).

METHOD OF DELIVERY

The overall caesarean delivery rate rose for the third consecutive year from 16.2 percent of births in 1996 to 17 percent in 1997, 17.3 percent in 1998 and 18 percent of births in 1999 (**Table 1B-2, Table 4A-11**). This latest rise in the total caesarean rates is the result of both a slight increase in rate of primary (or first) caesarean deliveries (from 11.2 percent in 1998 to 11.5 percent in 1999) and an increase in the rate of repeat caesareans from 76.2 percent of live births to women who had a previous caesarean in 1998 to 77.7 in 1999 (**Table 4A-11**). The rate of caesarean deliveries for low birthweight infants decreased from 35.6 percent in 1998 (the highest rate of the 11-year period 1988-1998) to 35.2 percent in 1999 (**Table 1B-3**).

ABNORMAL CONDITIONS OF THE NEWBORN

The abnormal conditions with the highest ratios per 100 live births were *assisted ventilation less than 30 minutes* (2.3 percent), *assisted ventilation 30 minutes or longer* (0.6 percent) and *hyaline membrane disease* (0.5 percent). *Birth injury* and *fetal alcohol syndrome* are likely to be underreported on birth certificates (the

identification of *fetal alcohol syndrome* more often occurs after the birth certificate has been completed). The rates of abnormal conditions in 1999 were higher for Black births (11.9 percent), than for non-Hispanic white (10.7 percent), Hispanic (9.5 percent), American Indian (9.2 percent) and Asian (8.8 percent).

CONGENITAL ANOMALIES (BIRTH DEFECTS)

Congenital anomalies are among the leading causes of fetal and infant mortality. In 1999 in Arizona, the overall rates of birth defects ranged from 2.9 per 100 births among American Indians, 1.3 per 100 non-Hispanic white babies, 1.1 among Asian babies, 1.2 among Black babies, to 0.9 among Hispanic newborns (**Table 1B-26, Table 1B-35**). The rate of *Down's syndrome* was 1.2 percent among mothers 35 years or older, 4 times greater than the rate of 0.3 percent for mothers 34 years old and younger (calculated from data in **Table 1B-34**).

NEWBORN INTENSIVE CARE

The number of newborns admitted to newborn intensive care units (NICUs) more than doubled from 2,576 in 1989 (3.8 percent of total births) to 5,319 in 1999 (6.6 percent of all newborns, **Table 1B-26**). Gestational age of 37 or less completed weeks of gestation, captured more NICU admissions than did low birthweight (63.0 and 46.7 percent, respectively, **Table 1B-33**). Differences in NICU admissions by maternal ethnic group ranged from a low of 4.8 percent for newborns of American Indian mothers, to a high of 9.3 percent among Black newborns.